

REMARKS

Claims 1-7 and 24-35 are pending in this application. Claims 1, 6, and 7 have been amended. Claims 24-35 have been added.

Claims 1, 6, and 7 have been amended to recite “array substrate.” Support for the amendments can be found in the specification at, *inter alia*, paragraph 0018 of the specification.

Support for new claims 24 and 25 can be found in the specification at, *inter alia*, paragraph 0007 and original claims 20 and 21. Support for new claims 26 and 27 can be found in the specification at, *inter alia*, paragraph 0015 (last sentence), and original claims 11 and 15. Support for new claim 28 can be found in the specification at, *inter alia*, paragraph 0018. Support for new claim 29 can be found in the specification at, *inter alia*, paragraph 0051.

Support for new claims 30-32 and 35 can be found in the specification at paragraphs 0050. Support for new claim 33 can be found in the specification at, *inter alia*, Example 1 under the section “Cleaning of Slides.” Support for new claim 34 can be found in the specification at, *inter alia*, original claim 4.

A clean copy of all of the pending claims is attached to this Amendment as an appendix. The appended clean copy of all of the pending claims is provided only as a convenience to the Examiner and is not intended to be an amendment of the claims pursuant to 37 C.F.R. § 1.121. No new matter has been added by the new claims; therefore, applicants respectfully request that examination continue on claims 1-7 and 24-35.

Rejections under 35 U.S.C. § 102

The Office Action has rejected claims 1-7 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,718,898 to Broeker *et al.* The Office Action asserts that Broeker *et al.* teaches a method for immobilizing biomolecules on a surface of a substrate comprising all of the limitations recited in claims 1-5, particularly the bridging paragraph at columns 8 and 9. Broeker *et al.* discloses diagnostic agents and assays for detecting *Saccharomyces sensu strictu* and epitopes thereof. Referring to Example 1 of Broeker *et al.*, antigens were transferred from gels

to nitrocellulose sheets. Nitrocellulose sheets are membranes prepared by reacting nitric acid with cellulose. Thus, nitrocellulose is composed of an organic material.

The invention as recited in claim 1 is a method for immobilizing biomolecules on a surface of an array substrate. An array is a collection of spots composed of biomolecules attached to a solid surface. The nitrocellulose strips disclosed in Broeker *et al.* are not arrays. In Broeker *et al.*, the nitrocellulose strips have an antigen attached to the test strip that can be used to test the presence of an antibody. Each nitrocellulose strip does not have a plurality of antigens configured in an array. Furthermore, there is no direction or motivation in Broeker *et al.* to produce an array of antigens. In the absence of any disclosure or teaching in Broeker *et al.* to produce arrays, the present invention as recited in claim 1 and all claims dependent therefrom are patentable.

The present invention as recited in new claim 30 and all claims dependent therefrom are also patentable over Broeker *et al.* New claim 30 recites that the substrate comprises an inorganic material. As discussed above, nitrocellulose is composed of an organic material and does not contain any inorganic materials, which is a feature of the substrate of claim 30. In the absence of any disclosure in Broeker *et al.* for using substrates composed of inorganic materials, the present invention as recited in new claim 30 is also patentable.

The Office Action has rejected claims 1-7 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2005/0059137 to Lee ("the Lee publication"). The 35 U.S.C. § 102(e) date of the Lee publication is May 31, 2001. Enclosed is a Declaration under 37 C.F.R. § 1.131, which antedates the Lee publication. In particular, Lee *et al.* recites:

A slide with aldehyde groups on [sic] surface was used as a bio-support material of the present invention. The slide prefers [sic] silylated slide. The commercial silylated slide has reactive aldehyde groups on [sic] surface. Firstly, the aldehyde groups of silylated slide were reacted with dendrimer and then schiff base between the aldehyde groups and the dendrimer was generated. Thus, a slide including the dendrimer monolayer on [sic] surface was generated. Next, the slide was performed with hydrogenation reaction by NaBH_4 , to convert non-reacted aldehyde groups to alcohol groups. Bio-support was prepared by the above method.

Paragraph 0033 (emphasis added).

Lee *et al.* uses sodium borohydride (NaBH_4) to reduce aldehyde groups to the corresponding alcohol (hydroxyl) groups. Sodium borohydride is the only reducing agent disclosed in Lee *et al.*

Where the only pertinent disclosure in the reference or activity is a single species of the claimed genus, the applicant can overcome the rejection directly under 37 C.F.R. § 1.131 by showing prior possession of the species disclosed in the reference or activity. (M.P.E.P. 715.03.) The Declaration with Exhibit A demonstrates that treatment of arrays with sodium borohydride prior to the filing date of Lee *et al.* Therefore, because the Lee publication has been antedated by the applicants, applicants respectfully request the rejection be withdrawn.

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CONCLUSION

Pursuant to the above remarks, reconsideration and allowance of the pending application is believed to be warranted. The Examiner is invited and encouraged to directly contact the undersigned if such contact may enhance the efficient prosecution of this application to issue.

No fee is believed to be due; however, the Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to Deposit Account No. 50-1513.

Respectfully submitted,
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APPENDIX

Clean Copy of All Pending Claims after Amendment (for the Examiner's convenience only)

What is claimed is:

1. A method of immobilizing biomolecules on a surface of an array substrate comprising:
providing the array substrate having a first surface including a functional group for non-covalent attachment to a biomolecule;
contacting at least a portion of the first surface with a reducing agent;
attaching a biomolecule to the functional group.
2. The method of claim 1, wherein the reducing agent includes a hydride.
3. The method of claim 1, wherein the reducing agent includes a borohydride.
4. The method of claim 3, wherein the borohydride includes sodium borohydride.
5. The method of claim 4, wherein the sodium borohydride is in a solution at a concentration ranging from 0.01% to 1% by volume.
6. An array substrate made in accordance with the method of claim 2.
7. An array substrate made in accordance with the method of claim 5.
24. The method of claim 1, wherein the array substrate is coated with an amino-silane.
25. The method of claim 24, wherein the amino-silane includes gamma-amino-propyl-silane.
26. The method of claim 3, wherein the sodium borohydride is in a solution at a concentration ranging from 0.2% to 0.3% by volume.
27. The method of claim 1, wherein the reducing agent includes sodium cyanoborohydride, copper sulfate, or hydrogen.
28. The method of claim 1, wherein the array substrate comprises a microarray.
29. The method of claim 1, wherein the array substrate comprises an organic material.

30. A method of immobilizing biomolecules on a surface of a substrate comprising:
providing a substrate having a first surface including a functional group for non-covalent attachment to a biomolecule, wherein the substrate comprises an inorganic material;
contacting at least a portion of the first surface with a reducing agent;
attaching a biomolecule to the functional group.
31. The method of claim 30, wherein the inorganic material is a metal, a semiconductor material, a glass, or a ceramic material.
32. The method of claim 31, wherein the glass or ceramic material is quartz, glass, porcelain, alkaline earth aluminoborosilicate glass, or a mixed oxide.
33. The method of claim 30, wherein the substrate is a glass slide.
34. The method of claim 30, wherein the borohydride includes sodium borohydride.
35. A substrate made in accordance with the method of claim 30.